

CLAIMS

We claim:

1. An inhaling device for dispersing through the respiratory tract only one dose of powdered medicaments
5 contained in a capsule at a time, said device comprising:
 means for holding the capsule within a compartment inside said inhaling device;
 means for splitting the capsule;
 means for releasing the powdered medicaments contained
10 in the capsule, said capsule enclosed in an outer case;
 means for holding pieces of the case of the capsule after said case has been split and to prevent the powdered medicaments from aggregating; and
 means for delivering to a user the powdered
15 medicaments of the capsule released into the inhaling device.
2. The inhaling device according to claim 1 wherein
20 said compartment is located inside a cover or inside one or more chambers within said device, said compartment proximate said means for holding said capsule, into which the capsule is inserted and held therein during operation of incision of said capsule so as to guarantee proper dispersion of the powdered medicaments contained in the
25 capsule.
3. The inhaling device according to claim 2 wherein
said means for splitting said capsule is comprised of a

cutting element, said cutting element comprised of a blade or pointed element.

4. The inhaling device according to claim 1 wherein
5 said means for delivering the powdered medicaments includes a mouthpiece from which the user can inhale the powdered medicaments.

5. The inhaling device according to claim 3, wherein
10 the cutting element that cuts the capsule moves up and down by means of a spring.

6. The inhaling device of claim 5 wherein said means
for holding the capsule comprises a body, said body
15 comprising a first chamber with said cover at one end, a second chamber cooperatively connected to said first chamber at said first chamber's opposite end, and a lower chamber cooperatively connected to a bottom end of said second chamber, said lower chamber including an aperture
20 therein, said aperture adapted to house the powdered medicaments produced after breakage of the capsule thereby facilitating manufacturing and assembling and considerably reducing costs of the mass production of the device.

25 7. The inhaling device of claim 6 wherein said compartment into which the capsule is placed further comprises a circular groove, and said second chamber further comprises a hollow portion wherein said capsule

rests upon said circular groove and fills the hollow portion.

8. The inhaling device of claim 7 wherein said means
5 to hold the pieces of the case of the capsule after said capsule has been split and to prevent the powdered medicament from aggregating comprises a reservoir having a series of slots on its walls to hold larger, aggregated pieces of the powdered medicament inside while letting non-
10 aggregated powdered medicament pass through thereby allowing the pieces of the case of the capsule to remain inside the reservoir, said reservoir having the function of preventing the powdered medicament from aggregating in a humid atmosphere, which may obstruct its dispersion into
15 the lower chamber and the consequent inhalation by the user.

9. The inhaling device of claim 7 further comprising means for securing the capsule within the device, said
20 means for securing the capsule comprising said cover, which covers the first chamber, and two outer protrusions on the cover's walls that stop under a pair of inner protrusions of the first chamber, thereby preventing the cover from accidentally escaping from its place.

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10. The inhaling device of claim 9 further comprising means to allow the cover to move perpendicularly with respect to the capsule until the cover abuts the inner protrusions, wherein said spring, inside the first chamber,

touches an outer edge of the hollow portion of said second chamber on its lower side and an inner surface of the cover on its upper side.

5 11. The inhaling device of claim 8 wherein said pointed element within said cover passes through said spring whereby when pressure is applied to the cover, the pointed element will perforate the capsule placed into the hollow portion, thereby releasing the powder medicament
10 into the aperture of said lower chamber and holding pieces of the case in the reservoir.

12. The inhaling device according to claim 7, wherein the capsule is located in the hollow portion of said
15 compartment in a substantially horizontal position when the cover is vertical, or in a substantially vertical position when the cover is horizontal thereby allowing the cutting element to perforate the capsule when the cover is pressed respectively down in a vertical and perpendicular direction
20 towards the capsule, or laterally, in a horizontal and perpendicular direction towards the capsule.

13. The inhaling device according to claim 3, wherein the operation of incision of the capsule and consequent
25 inhalation of the powdered medicament by the user can be performed by holding the inhaling device with one hand, and rotating the cover with the other hand until the cutting element connected to the cover touches a lower part of the

capsule and the device is placed in the user's mouth and the powdered drug inhaled.

14. An inhaling device for dispersing through the respiratory tract only one dose of powdered medicaments contained in a capsule at a time, said capsule enclosed within a case, wherein said capsule is split by means of rotating a cover of the inhaling device, said device comprising:

10 means to hold and split the capsule and then release the powdered medicaments contained therein, comprising a body having a substantially horizontal chamber, said horizontal chamber in a substantially horizontal position and equipped with an opening at its top, said horizontal
15 chamber cooperatively communicating with a lower chamber at its bottom, said lower chamber comprising an aperture, thereby forming a single element;

means to hold the capsule inside the horizontal chamber, having an open compartment into which the capsule
20 is placed in a substantially horizontal position, said capsule resting on a circular groove of said compartment;

means to hold pieces of the case of the capsule after said case has been split and to prevent the powdered medicaments from aggregating, comprising a reservoir
25 situated under a division point of the capsule, said reservoir having a series of slots on its walls adapted to hold larger, aggregated pieces of said capsule therein, while letting the powdered medicaments pass through;

means for closing said horizontal chamber containing the capsule, said closing means comprising a cover that closes an upper end of the horizontal chamber, and two outer protrusions projecting from the cover's walls that stop under two inner protrusions projecting from the horizontal chamber, thereby preventing the cover from accidentally escaping from its place and, at the same time, ensuring a greater stability of the capsule during the operation of incision;

10 means for splitting the capsule comprising a cutting element connected to the cover and attached to its inner edge;

means to allow the cover to rotate, said cover and said horizontal chamber each having a substantially circular shape so as to split the capsule with a simple rotation of the cover in any direction until the cutting element reaches and cuts the capsule; and

means to deliver the powdered medicament of the capsule released into the chamber to a user, comprising a mouthpiece from which the user can inhale the powdered medicament.

15 15. The inhaling device according to claim 14 wherein said cutting element comprises a blade or pointed element.

25 16. The inhaling device according to claim 14, wherein the cutting element is connected and perpendicular to the cover and to the capsule, so that as said cutting element rotates and follows the rotation of the cover, the cutting

element will cut part of the case of the capsule, removing it and letting the powdered medicament and pieces of the case fall into the reservoir below, said reservoir letting only the powdered medicament enter the aperture in order to be inhaled.

17. The inhaling device according to claim 14, wherein operation of incision of the capsule and consequent inhalation of the powdered drug by the user can be easily performed by the user holding the inhaling device with one hand and rotating the cover with the other hand until the cutting element connected to the cover touches a lower part of the capsule and the device is placed in the user's mouth and the powdered medicament inhaled.

18. An inhaling device for dispersing through the respiratory tract only one dose of powdered medicaments contained in a capsule at a time, said capsule enclosed within an outer case, wherein said capsule is split by means of a cutting element that moves inside a unique horizontal chamber, said inhaling device comprises:

means to hold the capsule and then release the powdered medicaments contained therein, having a body comprising a first chamber in a substantially horizontal position, said body equipped with an opening on top and connected at its bottom to a lower chamber;

means to hold the capsule inside the substantially horizontal first chamber comprising an upper open compartment into which the capsule is placed in a

substantially vertical position, said capsule resting on a circular groove within said compartment;

means to hold pieces of the case of the capsule after it has been split and to prevent the powdered medicament from aggregating, said means to hold pieces of the case of the capsule comprising a grid reservoir;

means to split the capsule comprising a cutting element located inside the first chamber, said splitting means further comprising a system of one or more holes into which the capsule or a portion thereof is placed, said one or more holes having a vertical axis that coincides with a vertical axis of the inhaling device;

means to allow the cutting element to move comprising a rotating hinge at an end portion of the cutting element, said hinge connected to an inner corner of the first chamber, so that by pressing with a finger on an end portion of the cutting element, the cutting element splits the capsule in a substantially horizontal direction causing dispersion of the powdered medicament that will be later inhaled by a user; and

means to deliver the powdered medicament of the capsule released into the aperture, said delivery means comprising a mouthpiece from which the user can inhale the powdered medicament.

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19. The inhaling device according to claim 18, wherein, by pressing the end portion of the cutting element, said one or more holes, which have a cutting inner perimeter and comprise a part of the capsule, move in a

substantially horizontal direction so that the cutting element removes the lower part of the capsule, letting the powdered medicament fall into the reservoir below, together with pieces of the case.

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20. The inhaling device according to claim 18 further comprising a cover, said capsule is inserted in a substantially vertical position into the compartment inside the cover, through a notch within the upper part of the
10 cover.